

## COMPONENT APPROACH LIMITS ADVANCED CONTROLS

Many classroom lighting systems provide mediocre lighting quality and have high energy costs. Although new high-efficiency systems are available, they must be built piecemeal approach when including automatic controls for occupancy and dimming. Specifying control components individually greatly increases design time and cost. Additionally, each component carries an individual warranty, causing confusion if performance problems occur.

The Integrated Classroom Lighting System (ICLS) combines high quality lighting, increased flexibility, daylighting, and energy efficiency into an affordable, easy to use, and easy to maintain single-source solution.

The ICLS standard package includes:

- Direct/indirect fixtures
- Two rows of fixtures for maximum savings
- Teacher control center located at the front of the room
- Manually switched rows for daylighting control
- Automated dual-technology occupancy sensor
- One source for layout, pricing, and warranty
- 3500k XPS T8 lamps and instant-start ballasts
- Five-year system warranty includes ballasts, sensors, and controls

Options include daylight dimming and a third row of fixtures for better uniformity.

## INTEGRATED CLASSROOM LIGHTING SYSTEM

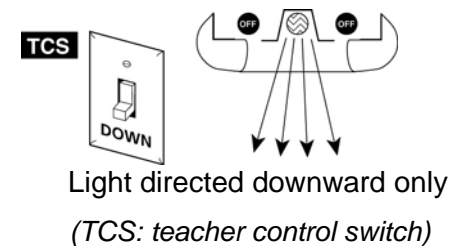
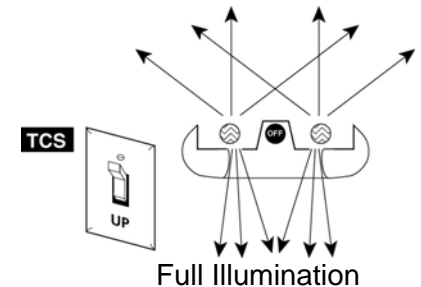
*PIER RESEARCHERS DEVELOPED AN INTEGRATED, PLUG-AND-PLAY CLASSROOM LIGHTING SYSTEM WITH FULLY INTEGRATED CONTROLS. THE SYSTEM INCLUDES A SINGLE-SOURCE FOR LAYOUT, PRICING, TRAINING, COMMISSIONING, AND WARRANTY. THE TEAM INSTALLED THE SYSTEM IN 19 CALIFORNIA CLASSROOMS AND CONFIRMED SYSTEM PERFORMANCE AND OCCUPANT SATISFACTION.*

*THE SYSTEM PROVIDES DIRECT/INDIRECT LIGHTING WITH OPTIONAL DIMMING CONTROLS. ENERGY USE IS APPROXIMATELY 50 PERCENT OF TYPICAL CLASSROOM LIGHTING, AND TEACHERS ARE ENCOURAGED BY THE CALMING EFFECT ON THE STUDENTS.*



*Heritage Oak School - Roseville, CA  
One of 19 classrooms involved in the study*

## EQUALLY EFFECTIVE IN NEW AND RETROFIT CONSTRUCTION



### Benefits

- High-quality, glare-free lighting ensures occupant satisfaction
- Teacher controls enhance the learning environment
- 0.95 watts/sq-ft energy use compared to 1.2–1.7 watts/sq-ft for new and older systems
- Immediate to nine-year simple payback for new installations depending on selected options
- 96 percent reflective paint reduces number of fixtures and energy use
- Plug and play components minimize design, installation, and commissioning time
- Innovative 24-volt surface mount control system cuts installation costs in retrofit spaces with limited ceiling or wall access

## INTERESTED?

School boards, superintendents, principals, architects, lighting designers, utility staff, and code officials can use information on the Integrated Classroom Lighting System in planning for new school construction or classroom renovations.

Key next steps include:

- Publicize the success of the demonstration projects.
- Inform the lighting community and school officials about the system's availability.
- Document system performance and occupant acceptance at future sites.
- Work with interested parties to incorporate the concepts into new construction designs and Title 24 energy conservation standards.

To purchase or learn more about the system, look for the Integrated Classroom Lighting System on the Finelite web site ([www.finelite.com](http://www.finelite.com)).

This project was part of the PIER Lighting Research Program. To view the study results, as well as other current research activities, visit [www.energy.ca.gov/pier](http://www.energy.ca.gov/pier).

Additional information about this technology can be found on the following websites:

- PIER contractor site:  
[www.archenergy.com/lrp/advlight\\_luminaires/project\\_4\\_5.htm](http://www.archenergy.com/lrp/advlight_luminaires/project_4_5.htm)
- PIER researcher site:  
[www.finelite.com/prodinfo/icls/icls\\_frmset.htm](http://www.finelite.com/prodinfo/icls/icls_frmset.htm)



Funded by the  
California Energy Commission  
Public Interest Energy Research Program

### Contact Information

California Energy Commission  
[www.energy.ca.gov/pier](http://www.energy.ca.gov/pier)  
Michael Seaman  
[mseaman@energy.state.ca.us](mailto:mseaman@energy.state.ca.us)

Architectural Energy Corporation  
[www.archenergy.com](http://www.archenergy.com)  
Judie Porter  
[jporter@archenergy.com](mailto:jporter@archenergy.com)

Finelite, Inc.  
[www.finelite.com](http://www.finelite.com)  
Terry Clark  
[tclark@finelite.com](mailto:tclark@finelite.com)



**FINELITE**  
Better Lighting For A Better Workplace

Arnold Schwarzenegger, *Governor*  
California Energy Commission  
*Chair:* Jackalyne Pfannenstiel  
*Vice Chair:* James D. Boyd  
*Commissioners:* Arthur H. Rosenfeld, Jeffery Byron,  
John L. Geesman

## INTEGRATED CLASSROOM LIGHTING SYSTEM



**SUPERIOR LIGHTING  
QUALITY WITH  
OPTIMIZED CONTROLS**



Public Interest  
Energy Research